**Key-Study Guide for Test over 8.5 A Structure of Atoms and 8.5 B Protons and Electrons**

1. What are the 2 major structural components of an atom? Nucleus and electron cloud
2. What are the 3 subatomic particles? Describe the location, charge, and mass

of each one. Protons-nucleus, +, 1 AMU Neutrons-nucleus, neutral, 1 AMU

Electrons-electron cloud, -, 0 AMU

1. In a neutral atom, which subatomic particles must be balanced (equal in number) and why?

Protons and electrons must be equal because the positive and negative charges must be balanced for the atom to be neutral.

1. What is the overall charge of the nucleus? Of the electron cloud? The overall charge of the nucleus is positive and the overall charge of the electron cloud is negative.
2. Which part of the atom contributes the most to the mass of an atom? Which part of the atom contributes the most to the volume (space) of an atom? The nucleus contributes the most to the mass and the electron cloud contributes most to the volume.
3. What does APE stand for and what can you determine about an atom using this mnemonic device? APE stands for atomic #=protons #=electrons # (in a neutral atom)
4. What does MAN stand for and what can you determine about an atom using this mnemonic device? MAN stands from Mass-Atomic #=Neutrons #
5. Which 2 subatomic particles do you add together to determine the mass of an atom?

The Protons and Electrons

1. Use APE MAN to determine the following:

Lithium- Carbon- Argon-

Atomic # 3 Atomic # 6 Atomic # 18

Atomic Mass 7 Atomic Mass 12 Atomic Mass 40

Protons 3 Protons 6 Protons 18

Electrons 3 Electrons 6 Electrons 18

Neutrons 4 Neutrons 6 Neutrons 22

1. What does the atomic number tell you? The atomic 3 tells you the number of protons and electrons ( in a neutral atom).
2. What determines the identity of an atom and why? Protons determine the identity of an atom because each element contains a unique # of protons.
3. What is an energy level in an atom? An energy level of an atom is an area around the nucleus that contains electrons.
4. Which energy level fills up first and how many electrons can it hold? The first energy level to fill is the one closest to the nucleus and it can contain up to 2 electrons.
5. How many electrons can the other energy levels hold? 8
6. What is a valence electron and how does it determine the reactivity of an atom? The valence electrons are the electrons located in the outer energy level. Atoms want to have a full outer shell. They will react in the presence of other elements to lose or gain electrons in an attempt to have a full outer shell.
7. Which atom is more reactive, one with 6, 7, or 8 valence electrons? Explain. An atom with 7 electrons is the most reactive because it only needs one electron to complete its outer shell.
8. Which atom is more reactive, one with 1, 2, or 3 valence electrons? Explain. An atom with valence electron is more reactive because it only needs to lose on valence electron to have a full outer shell.
9. Describe the octet rule and how it relates to reactivity. The octet rule states that atoms are most stable when they have a full outer shell (usually 8 electrons) and will react to lose or gain electrons to achieve a full outer shell.
10. On the next page Make Bohr models for the following atoms:

Boron Sodium

Helium Beryllium

1. Put each atom in order from most reactive to least reactive.

Sodium, Beryllium, Boron, Hydrogen

1. Describe the charge of each atom after it become an ion by losing or gaining an electron-

Boron -, Sodium -, Helium will remain stable and uncharged, Beryllium -